

**AMENDMENTS TO THE SPECIFICATION**

Please amend paragraph [0024] as follows:

[0024] A finished microfluidic device 232 is shown in FIG. 6. In use, the upper channel 228 is filled with buffer and analyte, and the lower channel 230 is filled with electrolyte. Electrodes 210 are in contact with the electrolyte in the lower channel, preferably at reservoirs 215, and potentials applied to the electrodes. The electrodes may receive voltage from any suitable power supply. A ground electrode 211 is placed in one of the reservoirs ~~215~~ 213 of the upper channel ~~204~~ 228. In use, the electrons introduced into the lower channel ~~208~~ 230 migrate through the gel 206 and impose a potential in the upper channel ~~204~~ 228. However, the products of electrolysis do not pass through the gel membrane 206 in appreciable amounts, hence they remain in the lower channel ~~208~~ 230 and segregated from the analyte in the upper channel ~~204~~ 228. This establishes a field within the upper electrode which is free of electrolysis products. The microfluidic device permits the application of electric potential to PDMS microfluidic in-channel electrodes without perturbing the pH of the buffer, or perturbing the fluid dynamics of the system via bubble generation. Other embodiments of the invention envision various semi-permeable membranes, and other configurations of the channels and electrodes.